JPRS 78443

2 July 1981

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 103

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ENERGY MINISTER REJECTS PLEAS FOR URANIUM CUTBACK

Canberra THE WEEKEND AUSTRALIAN in English 30-31 May 81 p 6

[Article by Kevin Love]

[Text] The Federal Government has renewed its commitment to uranium mining, rejecting a plea to follow France's example of withdrawing support for nuclear power.

The Minister for National Development and Energy, Senator Carrick, said yesterday the energy crisis could not be solved without at least some contribution from atomic power.

"Countries such as Japan and West Germany, whatever their present political policies, feel that they cannot see how they will solve their problems without supplementation of a significant kind by nuclear energy," Senator Carrick said.

Alternative fuels could not possibly fill the huge energy gap.

Senator Carrick said graffiti he had seen overseas recently was particularly useful in understanding the problem.

He told the Senate that one slogan read: "Ban all nuclear power generation."

Someone had added: "Yes, and let all the illegitimates freeze in the dark."

Senator Carrick confessed he had substituted a euphemism in recounting the added graffiti--but the message was an important one in support of nuclear power.

During question time, the deputy leader of the Australian Democrats, Senator Colin Mason, called on the Government to withdraw its support from the "dangerous, pollutant, uneconomic and thoroughly discredited nuclear power industry."

The Government should refuse to allow any further development of uranium mining, Senator Mason said.

He said local uranium was no longer needed overseas because two of the main customers had restricted their nuclear programs: France had cancelled a nuclear power plant in Brittany and postponed development of other plants; Japan was also reversing its policy.

In reply, Senator Carrick said France would run into big problems if it changed to coal power because of the construction delay of eight to 10 years.

Most people who understood the problem of providing alternative energy agreed that the energy crisis could not be solved by renewable energy of any sort, or by coal power generation.

"The burning of coal on that scale would create a pollution potential of a magnitude and a threat to health that people seem to ignore," he said.

"Everyone is keen to take the dangers of contamination and pollution away from human beings whether they come from uranium or from coal.

"But nobody wants to let the so-called illegitimates freeze to death in the dark."

CSO: 5100/7541

GOVERNMENT APPROVES SALE OF URANIUM TO BELGIAN COMPANY

Canberra THE AUSTRALIAN in English 5 Jun 81 p 20

[Article by Philip Beard: "Government Approves $90M ERA Sale"]

[Text] ENERGY Resources of Australia Ltd now has contracts for about 95 per cent of production from the Ranger uranium mine following the completion of a $90 million deal with a Belgian power company.

ERA announced yesterday it had received Federal Government approval for the sale of 1429 tonnes of uranium oxide to Synatom Societe Anonyme of Belgium.

Synatom is a privately-owned group responsible for buying nuclear fuels for electricity generation in Belgium.

Delivery depends on the bilateral safeguards agreement with Belgium covering the export of Australian uranium.

ERA said that following the Belgium contract, total sales for the first 10 years of production was now slightly more than the initial designed capacity of 3000 tonnes of uranium oxide a year.

This represents nearly 95 per cent of that capacity, although ERA has plans to lift capacity to 6000 tonnes.

The contract is understood to be for 10 years.

ERA declined to place a value on the contract, but with uranium now fetching around $60 a kg the deal is estimated to be worth around $90 million.

It is believed the contract also includes a floating price arrangement to cover movements in the world market.

In the ERA prospectus the delivery price for the first year is fixed and in the second and third years is subject to escalation related to movements in Australian material and labor costs.

But the market has been in a slump in recent times and the price of uranium oxide has halved over the past 18 months.

The recent problems in the Japanese nuclear industry and the election of a Socialist President in France has acted as additional bear factors on a nervous market.

Before the election the French were in the midst of an ambitious nuclear program and the Japanese are one of ERA's major customers.

The Belgian deal is the first since ERA signed a contract worth an estimated $200 million.

The Swedish power utility, Oskarshamnsverkets Kraftgrupp Akttiebolag (OKG), earlier this year signed a deal worth around $200 million to take 3150 tonnes.

The latest deal highlights the better than anticipated success that ERA has had in selling its Ranger production.

In its prospectus, the group said it had sales of 1429 tonnes under negotiation.

But since that prediction the group has sold another 4579 tonnes.

The OKG deal also saw the last slice of equity available for overseas utilities taken.

ERA has already negotiated sales with Japan, West Germany, Korea and the United States, with the Japanese and German groups taking most.

The Australian Government will also take 900 tonnes over the first three years of the mine's life to use as stockpile replacement.

This will limit the group's ability to make sales from the early life of the mine.

The Belgian deal takes the amount of ERA production committed to 42.700 tonnes.

CSO: 5100/7542

UNIONS JOIN IN FIGHT FOR NUCLEAR-FREE PACIFIC AREA

Thirteen-Nation Forum

Melbourne THE AGE in English 1 Jun 81 p 4

[Article by Michael Gordon]

[Text] Port Vila, 31 May--A meeting of union leaders from 13 countries today decided to set up an international body covering Pacific trade unions and begin a campaign for a nuclear-free Pacific.

The meeting decided unanimously to establish the Pacific Trade Union Forum to co-ordinate action on nuclear and other issues--despite recent decisions by the ACTU and the New Zealand Federation of Labor that their delegates would not discuss setting up a new body.

Australian and New Zealand officials gave their support for the forum when it became clear that other developing Pacific nations were prepared to "go it alone" with their own organisation.

A declaration adopted bythe meeting asked the ACTU and the New Zealand Federation of Labor for their attitude to the expansion of the new body's role to issues other than nuclear and the rendering of assistance "where appropriate" to unions and workers in the pacific region.

A spokesman for the developing nations, Mr James Raman, of the Fiji Trades Union Congress, said when officials from the developing nations learnt of the decisions to limit discussion to nuclear questions, they felt the mood of the conference had been "sabotaged."

While he did not wish to understate the importance of the nuclear issue, he believed the aspirations of island trade unions were "more real in day-to-day issues." These included the right to organise and negotiate fair wages and conditions.

The island nations had not agreed to a date for the next meeting of the forum's coordinating committee because they wanted to wait for the attitude of the ACTU and the Federation of Labor to its role. If they did not support the forum the developing nations "might have to go it alone."

The declaration of the meeting called on all trade unions and unionists in the Pacific to oppose vigorously the testing and storage of nuclear weapons, disposal of nuclear waste, the uranium industry and the proliferation of nuclear reactors.

It set up a "coordinating structure" to plan the campaign for a nuclear-free Pacific and "develop cooperation among trade unions and workers in the Pacific region."

The meeting also called on unions to exert pressure on the Government of Kiribati "by using all means available" over the sacking of 600 workers, and expressed support for striking public servants in Western Samoa and Guam.

It welcomed the decision of President Mitterrand of France to suspend nuclear testing in the Pacific, but warned of possible action if the testing programme was not abandoned completely.

The meeting said unions should examine the possibility of consumer boycotts on selected products from Japan, France and the United States "and any other country involved in nuclear activities." It also protested to the Prime Minister of Japan, Mr Suzuki, over plans to dump radioactive waste into the Pacific.

ALP Warning on Waste

Perth THE WEST AUSTRALIAN in English 26 May 81 p 33

[Text] Canberra--The Federal Government will be able to allow radioactive waste to be dumped into the ocean under legislation to be introduced in Parliament, according to Labor's environment and conservation spokesman, Mr S. J. West (NSW).

The Government could have drafted the Environment Protection (Sea Dumping) Bill of 1981 to prohibit the dumping of all types of radioactive waste in the sea, but it had not, he said in a statement.

"Japan is preparing to dump up to 45,000 barrels of radioactive waste into the Pacific Ocean each year," Mr West said.

"The Minister for Home Affairs and the Environment, Mr Wilson, in a letter to me said Japan had been told that Australia considered it essential that the disposal of nuclear waste in any environment, and in particular the Pacific Ocean, should be undertaken only in compliance with the strictest safety measures and in full accordance with the relevant international agreements on the subject.

"However, in 1977, both Australia and Japan abstained from a United Nations vote to establish a multilateral consultation and surveillance mechanism for the sea-dumping of radioactive waste."

Mr West said that the Federal Government should oppose all sea dumping of nuclear wastes and amend its proposed legislation to prevent such dumping.

CSO: 5100/7542

MINATOME RADIATION LEAK HITS PUBLIC WATER SUPPLY

Unacceptable Levels

Brisbane THE COURIER-MAIL in English 19 May 81 p 3

[Text] A small creek near the Minatome uranium stockpile at Ben Lomond showed radiation at twice the acceptable level during heavy rain in February this year, according to State Water Quality Council Tests.

The tests on February 17 showed acceptable radiation levels in two creeks near the mining lease and stockpile and in the Charters Towers weir.

But unacceptable radiation levels were found in the small creek at the Ben Lomond site, 60 km north-west of Townsville.

The acting Water Quality Council director, Mr H. D. Wallace, said yesterday, the maximum radiation level accepted by the National Health and Medical Research Council for gross Alpha radiation was 2.7 picocuries a litre.

The level in the small creek near the stockpile was 7 picocuries.

Mr Wallace said the radiation level in the seepage from the stockpile was 100,000 picocuries.

The heavy run and resultant run-off had diluted the concentration in the small creek by the time it reached Boghole Creek so the Gross Alpha reading there was only 1.5 picocuries.

Readings at separate places in Keelbottom Creek, into which Boghole Creek emptied, were 0.2 and 0.6 picocuries.

Minatome managing director, Mr Bertrand Cahen, said yesterday leakage had been discovered from the stockpile's covering in January through a fracture in the covering membrane.

The company had taken urgent measures to stop further leaks but the concrete cover was made of a porous material called gunite which allowed the radon gas produced by the uranium ore to escape into the atmosphere.

The porous nature of the gunite had allowed water to seep into the stockpile. This water had escaped through the fractured membrane.

The gunite covering could not be sealed with plastic, because this would cause a radon gas build-up that would be dangerous when the stockpile was opened

"There was some slight leakage after heavy rain," Mr Cahen said. "There was nothing abnormal as far as radio activity.

"Material used in the cement contained mineral salt that killed the grass on a section 8-10 m long by 1-2 m wide near the stockpile."

Mr Cahen said Water Quality Council tests had shown there was no danger.

"Nothing really has happened. Some people wanted to make a lot of noise," he said.

Company Denial

Brisbane THE COURIER-MAIL in English 20 May 81 p 3

[Article by Mark Williams: "Radiation From Uranium Denied"]

[Text] Townsville--Standing on 3500 tonnes of uranium ore is an unusual way to give an assurance of radiation safety.

But Minatome operations manager, Mr Keith Folwell, went to the top of the company's 5 metre-high ore stockpile at Ben Lomond yesterday to attack claims of radiation pollution in local creeks.

Mr Folwell admitted a leak had occurred from the stockpile about 60 km north-west of Townsville in February this year, but denied that any pollution had resulted. "We took 19 tests in the area and found no evidence of radiation or uranium levels anywhere near permissible levels," he said.

"The Water Quality Council took only two samples and hasn't been back since."

Mr Folwell said it was impossible for rainwater from heavy falls in February to have caused uranium leaks from the stockpile ore. From 20 to 40 kg of acid was needed in normal production to leach the uranium from one tonne of ore.

He said the leak in February had been caused by water which entered the stockpile through the concrete cover's porous surface and through small cracks.

This water had left the stockpile through tiny pinholes in the membrane base. In the process it had picked up sulphates and ferrous material from the concrete and the ore.

"These sulphates or mineral salts--not the radiation--killed the grass on the northern side of the stockpile," Mr Folwell said.

Security at the Ben Lomond mining lease is minimal. Mr Folwell said this was largely because there was only mining and prospecting equipment that needed security.

On the whole area yesterday, there was only one radiation warning sign. That was on the company's test mine on the Ben Lomond ridge.

There also were steel locking doors on the mine shaft. Minatome's radiation safety officer, Mr Ian Ferris, said yesterday the doors were there to stop access to the mine when the ventilation system was not operating.

The gates were needed because of the build-up of radon gas that seeped from the exposed uranium seam and ore.

This gas was the reason only a thin layer of a type of concrete called shotcrete was used to cover the company's ore stockpile. The porous nature of the concrete allowed the gas to leave the stockpile safely.

Test mining on Minatome's mining lease has yielded about 3500 tonnes of ore from the 9000 tonnes of material extracted from the mine.

Mr Folwell said he decided last year to put the company's two uncovered stockpiles together on a sand-based, non-porous plastic membrane and to cover it with concrete.

The average 50 mm covering of shotcrete showed cracks up to 2 mm wide yesterday, even in repaired areas. "These would not allow much water in at all," Mr Folwell said.

The recent leakage discovered on February 16, came through small punctures in the membrane. There had been no overflow.

CSO: 5100/7561

NUCLEAR PACT WITH EEC PERMITS SENDING OF URANIUM TO USSR

Enrichment Exports

Melbourne THE AGE in English 22 May 81 p 4

[Article by Russell Skelton]

[Text] CANBERRA. — Australia's nuclear safeguards agreement with the European Economic Community permits community countries to send uranium to the Soviet Union for enrichment.

But under the terms of the agreement the EEC countries must receive back from the Soviet Union the same quantity of uranium sent for enrichment.

The Deputy Prime Minister, Mr Anthony, and the Minister for Foreign Affairs, Mr Street, yesterday welcomed the announcement in Brussels that the EEC foreign ministers had agreed to sign the safeguards agreement with Australia.

The agreement with the European Atomic Energy Community is regarded as an important breakthrough for Australia in its efforts to raise the level of safeguards surrounding the sale, export and processing of nuclear material.

It is the first time that many of the EEC countries have been prepared to accept the safety levels proposed by Australia. Some of the countries such as Britain and France have already signed bilateral agreements.

Mr Anthony said the way was now opened for the exports of Australian uranium to the European Community under new contracts.

EEC processing of Australian uranium is covered in the "all in, all out" clause of the agreement. These transfers will be monitored by the International Atomic Energy Agency.

At present 40 per cent of all EEC processing is carried out in the Soviet Union. This figure is expected to drop dramatically when a new French enrichment plant becomes fully operational.

Under the agreement uranium can be enriched to only 20 per cent with the isotope uranium 235. This is well below the enrichment required to bring the material up to nuclear weapons grade.

The safeguards agreement contains strict conditions on the reprocessing of spent nuclear fuel from reactors. Reprocessing cannot take place without Australia's express consent.

One original aim of the Australian negotiators was for a reciprocal agreement to cover the eventual transfer of European nuclear technology to Australia.

According to Government sources this has not been achieved. Australian officials hope these arrangements can be covered in future bilateral agreements.

The EEC agreement is the first umbrella safeguards agreement negotiated by Australia. It covers 10 countries.

Spain will not be covered by the agreement when it joins the EEC.

Mr Street said the text of the agreement would be made public after it was signed and presented to Parliament.

Senate Query

Canberra THE AUSTRALIAN in English 27 May 81 p 6

[Text] The Federal Government was asked yesterday to give a categorical assurance that Australian uranium sent to Russia for enrichment would be accurately accounted for.

Last Thursday the Prime Minister, Mr Fraser, announced the conclusion of a nuclear safeguards agreement with the EEC permitting the exchange of uranium with the Soviet Union.

The leader of the Australian Democrats, Senator Don Chipp, asked the Leader of the Government in the Senate, Senator Carrick, for an assurance that the monitoring was fail-safe and that all uranium would be accounted for meticulously.

Senator Carrick replied: "It is a melancholy fact that the Soviet Union has an abundance of plutonium in stock which is many times the supply it needs for warlike purposes."

CSO: 5100/7541

RANGER URANIUM DEPOSIT RESERVES INCREASE BY 23.8 PERCENT

Canberra THE AUSTRALIAN in English 28 May 81 p 28

[Article by Bruce Jacques: "Ranger Research Upgraded By ERA"]

[Text] Energy Resources of Australia has substantially upgraded its uranium reserves at the Ranger deposit in the Northern Territory, which could add more than $1000 million to revenue over the life of the mine.

ERA raised its calculation of probable and possible reserves of uranium oxide at its No 3 ore body from 58,000 tonnes to 71,803 tonnes--a lift of 23.8 per cent.

The new reserves, calculated on a cut-off grade of 0.05 per cent U308, are 23.62 million tonnes of probable ore grading 0.182 per cent U308 and 14.47 tonnes of possible ore grading 0.198 per cent U308.

This gave a total of nearly 31.1 million tonnes of ore grading 0.188 per cent U308.

It compared with reserves listed in last year's ERA prospectus of 14 million tonnes of probable ore grading 0.2 per cent U308 and possible reserves of 14.78 million tonnes with the same grade for a total of 28.78 million tonnes grading 0.2 per cent U308.

ERA said the upgrading followed the completion of a diamond drilling program at 100m spacing.

The company said the increase related almost entirely to deep reserves in the eastern part of the ore body which was still open at depth in the north-east and south-east corners.

It said reserves at the No 1 ore body remained unchanged at 15.87 million tonnes of ore grading 0.333 per cent U308, for a total of 52,878 contained tonnes of uranium oxide using a 0.1 per cent U308 cut-off grade.

At current uranium oxide prices of around $25 a lb, the extra reserves would be worth about $1036 million in extra revenue to the Ranger participants.

The reserve lift would also extend the mine's life for more than four years at the projected initial production rate of 3000 tonnes of uranium oxide a year, although ERA plans to double this if demand is sufficient.

ERA already has contracts for more than 90 per cent of total projected output up to 1992, falling to about 78 per cent for the four years to 1996.

This followed the clinching, early this year, of all contract arrangements outlined in the prospectus.

The last of these was a contract, probably worth close to $200 million, with a Swedish power utility which also took a 1 per cent stake in the venture.

CSO: 5100/7541

CONSORTIUM TO STUDY LOCAL URANIUM ENRICHMENT FEASIBILITY

Melbourne THE AGE in English 5 Jun 81 p 1

[Article by Ian Davis]

[Text] Canberra--A consortium of companies will study the feasibility of producing enriched uranium in Australia.

The Minister for National Development and Energy, Senator Carrick, announced yesterday that the Government had given approval for the Uranium Enrichment Group of Australia to study setting up an industry in Australia. Enriched uranium is the basic power source for nuclear power plants and the process can produce weapons-grade material suitable for nuclear weapons.

The Uranium Enrichment Group of Australia is a consortium of BHP, CSR, Peko-Wallsend and Western Mining Corporation. The group has already undertaken a "pre-feasibility study" and has advised the Government that two of the possible enrichment technologies, centrifuge and chemical exchange, would be suitable for any industry established in Australia.

The consortium was advised by the Atomic Energy Commission on technical aspects during the pre-feasibility study. Senator Carrick said yesterday that the commission would advise the group during the feasibility study.

The study is expected to take about 2-1/2 years. The early stage will concentrate on identifying the preferred supplier of technology for enrichment plant in Australia and the latter part will concern sites for the plant. These would depend on the technology selected.

Discussions

Labor's spokesman on urban and regional affairs, Mr Uren, yesterday called on the Government to make the pre-feasibility study available for public discussion.

"In authorising a full feasibility study by the UEGA the Government has taken another step towards establishing a nuclear industry in Australia," he said. "Such a decision should not be made without full public discussion."

A spokesman for Senator Carrick said yesterday that the Australian Government would need to "make Government-to-government arrangements" for the study to proceed. He said there would probably need to be some agreement arrangements" for the study nuclear technology as a part of the study. The spokesman said that any enrichment plant "would need to be rebuilt to produce weapons grade material. But the technology is common to both uses."

CSO: 5100/7542

NUCLEAR LEGISLATIVE CHANGES WILL HELP DEVELOP INDUSTRY

Melbourne THE AGE in English 6 Jun 81 p 3

[Article by Michelle Grattan: "Change in Nuclear Laws: More Power to States"]

[Text] Canberra--The Federal Government yesterday announced that it would make "far-reaching" changes to Commonwealth legislation on nuclear matters.

The changes--together with new laws to be enacted by State Governments--will provide a framework for the development of a nuclear industry and give the States a good deal of power to regulate nuclear activities.

They follow a review ordered last August of the Commonwealth Atomic Energy Act and other Commonwealth legislation affecting nuclear energy.

The Deputy Prime Minister, Mr Anthony, and the Minister for National Development, Senator Carrick, said yesterday the Commonwealth would be undertaking its rewriting of legislation in "close consultation" with the States.

Government sources said that priority would be given to the development of nuclear non-proliferation legislation, taking account of the respective areas of competence of the Commonwealth, State and Northern Territory Governments.

Such legislation would cover the implementation and enforcement of nuclear safeguards arising from international obligations, including physical protection of nuclear material and the protection of classified information and sensitive technology.

The Commonwealth will also seek to develop a legal framework for the licensing and regulation of health, safety and environmental aspects of nuclear activities under State and territory legislation using, where appropriate, complementary Commonwealth legislation.

The officials' review concluded that nonproliferation legislation should be enacted "as a matter of urgency to provide a clear basis for meeting the Commonwealth's nuclear non-proliferation obligations."

CSO: 5100/7542

BRIEFS

NUCLEAR WASTE DISPOSAL--Austrlia could have full-scale production of a world-leading method of nuclear waste disposal within 10 years. Australian National University research fellow in Earth Sciences, Dr Virginia Oversby, made this prediction at the ANZAAS Congress yesterday. But it was unlikely Australia, without nuclear reactors, would have a plant to produce Synroc and process waste commercially, she said. Synroc--a synthetic rock containing three rare natural minerals--was developed in 1978 at the ANU in Canberra. Dr Oversby said the overseas sale of the process would depend on costs which could be determined only after a full-scale pilot plant was set up. She said Synroc was a thousand times more efficient as a nuclear waste form than the present method of combining the waste in a glass form. In a million years the waste would have been converted to a state comparable with the original uranium used for the nuclear process. [Text] [Brisbane THE COURIER-MAIL in English 16 May 81 p 10]

URANIUM THEFT SENTENCE--Mount Isa--A 52-year old man convicted of stealing 2.2 tonnes of uranium oxide worth more than $100,000 from the Mary Kathleen uranium mine in north-east Queensland was sentenced yesterday to five years' jail with hard labor. James Alexander McDonald, of Mount Isa, was sentenced in the Mount Isa District Court after pleading guilty to the theft between 30 April 1977 and 1 July 1978. The court was told that McDonald took the uranium out in one-and two-gallon tins. The prosecutor, Mr Brendan Butler, said McDonald told police that he filled six 44-gallon drums with the uranium oxide using a funnel. The Crown also alleged that the drums were sent to a Sydney firm which called in police after experts examining the uranium said it could only have come from Mary Kathleen. [Text] [Melbourne THE AGE in English 19 May 81 p 3]

MARY KATHLEEN STOCKPILING--Industrial trouble and an oversupply of uranium on the world market have thrown a shadow on the future of Mary Kathleen mine. A shipment of uranium yellowcake worth $12 million from the mine has been stranded in Mayne railway yards in Brisbane for six weeks because of a Seamen's Union ban. Mary Kathleen Uranium Ltd general manager, Mr Colin Smith, said from Melbourne yesterday arrangements were being made for shipping the uranium. He said uranium in the meantime was being stockpiled at Mary Kathleen. The stockpile at Mary Kathleen. The stockpile was normally two to three weeks' supply, but had now grown to four weeks. Mr Smith said shipping bans had cost the company $1.5 million a year which could have been earning 12 to 14 percent. This would be assessed when looking at the mine's future. [Text] [Brisbane THE COURIER-MAIL in English 19 May 81 p 3] A Swedish ship has sailed from Brisbane without trouble after loading 12 containers of uranium oxide held in the Mayne railway yards for six weeks. The uranium, from Mary Kathleen was loaded on the roll-on-roll-off container ship Paralla, which sailed on Monday. Mary Kathleen Uranium Ltd general manager, Mr Colin Smith, said uranium yellowcake worth $12 million from the mine had been stranded in the railway yards because of a Seamen's Union ban. The union had a policy opposed to the mining, stockpiling and export of uranium from Australia but had no bans in force while the uranium was at the railway yards. [Excerpt] [Brisbane THE COURIER-MAIL in English 20 May 81 p 1]

CALL FOR NUCLEAR WEAPONS--Toowoomba--The Returned Services League national president, Sir William Keys, called yesterday for improved Australian technology with potential for the rapid development of nuclear-weapons. "If we do not have that capability potential, and the need for it arises, we shall be years behind," he said. "If the fundamental technology is established, a nuclear-weapon capability could be developed in a short time if it is needed. The Federal Government must look to the development of such a capability." Sir William said a nuclear capability could be developed through the establishment of a nuclear reactor. Speaking at the annual state congress of the Queensland branch of the RSL, Sir William said that another Indonesian coup of the kind that happened in the 60s could put Australia in a dangerous position. He said that Australia's defence needs required the back-up facilities of a national industry geared to those needs. This would enable Australia to be self-reliant in defence supplies if those from overseas were interrupted. [Excerpt] [Brisbane THE COURIER-MAIL in English 3 Jun 81 p 3]

URANIUM LOAN REPAYMENT--Queensland Mines has returned all of the uranium it borrowed from the Australian Government stockpile, more than four years since the company declared force majeure on its first supply contract. On 23 March 1977, Queensland Mines shocked the business community when it announced its inability to meet supply demands to the Japanese utility company Shikoku Electric Power Co. Some weeks later it said that it was also unable to supply Kyusu Electric Power. When the Government first approached the miner with its offer to lend uranium from the Australian Atomic Energy Commission stockpile, Queensland Mines said the borrowing terms were impractical because there was no warranty that the material supplied would conform to contract requirements. At the time, Queensland Mines' chairman, Mr James Millner, told shareholders: "The company cannot accept the responsibility to supply this material to its consumers. Such an acceptance could place the company in breach of its contract if the material proved to be unsatisfactory and expose the company to a possible damage suit." However, an agreement was finally reached whereby Queensland Mines supplied the Japanese companies with uranium from the Australian Atomic Energy Commission, and then paid the Government the proceeds of the sales. Once the company began production it replaced the ore and the Government returned the money which amounted to $62 million. [Text] [Melbourne THE AGE in English 10 Jun 81 p 19]

CSO: 5100/7543

GOVERNMENT FACTORY TO PRODUCE MOTORS FOR NARORA

New Delhi PATRIOT in English 25 May 81 p 4

[Text] Bangalore, May 24--The new government electrical factory (NGEF), Karnataka State Public Sector Undertaking, will be the first public sector undertaking in the country to produce 2,800 KV or 4,000 Horse Power motors to be used for continuous operation at the Narora atomic power project in Uttar Pradesh.

This was disclosed here yesterday by NGEF chairman Venugopal Naidu at a press conference.

He said the company has secured orders from the Atomic Energy Commission to manufacture and supply six such motors to be used at the Narora atomic power station. Each motor will cost Rs 30 lakh, he added.

Mr Naidu also disclosed that for the first time in the country the NGEF has also developed a roller table motor and 800 such motors had been supplied for the Bhailai steel plant expansion project at a cost of Rs 2.4 crore.

Giving out the achievements of the NGEF for 1980-81, Mr Naidu said, the company had set a record by giving production of Rs 45.13 crore recording 17 per cent growth compared to the previous year's production of Rs 38-70 crore.

Mr Naidu further said that the company's sales were of the order of Rs 56.83 crore which was 21 per cent more than that of the previous year.

Mr Naidu said this was the picture despite the company paying Rs 3.72 crore as interest on bank loans. Mr Naidu further said as our planned production of motors in terms of Horse Power would excepted the licensed capacity by 25 per cent we have applied for increasing the licensed capacity from 4.80 lakh HP to 8.00 lakh HP.

The NGEF chairman said that in order to increase the Horse Power capacity of motors produced by the company they have completed expansion projects costing Rs. 16 crore.

Mr Naidu also told newsmen that in keeping with modern technology and the demand for sophisticated products, the NGEF has undertaken to manufacture new products like SF-6 circuit breakers for voltages up to 420 KV and diodes and thyristors of higher ratings.

Some of the prestigious orders the NGEF has secured and is executing are Colun turnkey electrification of Ramgarth coal washery for washing three million tonnes of coal perannum and turnkey order for Nowgong and Cachar plants in Assam.

CSO: 5100/7105

VILLAGERS EXPECT NUCLEAR TEST IN RAJASTHAN

Karachi DAWN in English 7 May 81 p 14

[Text]

NEW DELHI, May 6: Villagers in nine hamlets in the northwestern state of Rajasthan fear evacuation because they believe that Prime Minister Indira Gandhi's Government will soon explode a second nuclear device in their area, the "Indian Express" newspaper reported on Tuesday.

However, Rahul Bedi, the reporter who visited the Pokharan area where India exploded its first atomic device in 1974, said in his report that evidence to back the fears of the villagers was "nebulous".

Gokul Das, a deputy headman at Loharki village, three kilometres (1.8 miles) from the site of the 1974 blast, told Bedi that he had received official word on March 10 for a meeting with eight neighbouring settlements to consider the evacuation of the settlements.

But the meeting was not held and no dates were fixed for the proposed evacuation, Das was quoted as saying.

However, Das added that local authorities have built barbed wire fences hemming in about 24 square kilometres around the seven-year blast site. The Indian army also uses the place as a firing range for testing artillery and tanks.

Village leaders from Pokharan say that authorities have banned natives from visiting the enclosed area.

A local Government official told Bedi that he had "heard talk of an impending explosion" but had no official information about the reported evacuations.

Pokharan in the Thar desert is located about 550 kilometres (330 miles) south-west of here. US Senator Alan Cranston claimed last week that India was planning to explode an atomic device in the same region. Indian nuclear officials have declined comment on the reports.—APA.

CSO: 5100/7107

RETIRED GENERAL STATES CASE AGAINST INDIAN BOMB

Calcutta THE STATESMAN in English 27 May 81 p 8

[Article by S. N. Antia]

[Text]

CALLING for a rational debate on the demand for a nuclear weapons programme, the author, who retired from the Army as Major General, argues that it cannot be justified on either geopolitical or purely military considerations. Nor does he think that India should seek a guarantee of nuclear protection, especially in view of its political implications. General Antia thinks that the best guarentee would be the self-reliant will of a united and economically strong nation.

THE Prime Minister's recent statement in Parliament that if Pakistan developed nuclear weapons India would respond "in an appropriate manner" has given a fresh impetus for debate. There is already a vociferous demand that India must acquire nuclear weapon capability. While it would be incorrect to evaluate our national security posture—whether under conventional or nuclear war asymmetry—in military terms alone, it would be equally incorrect to evaluate this issue solely on geopolitical considerations.

Prima facie, the Prime Minister's statement does not constitute a basic shift in our nuclear policy. At the present juncture it is presumably meant to impress upon both Pakistan and the USA, particularly the latter, that waiving or modification of the Symington amendment to facilitate the flow of massive military aid to the former would be considered an act of diplomatic duplicity, and that India's peaceful nuclear stance cannot be taken for granted if the USA still acquiesces in Pakistan's nuclear military ambitions.

However, it is not so much the question of India or Pakistan, or both, acquiring nuclear military capability as that of acquiring nuclear military credibility which needs to be analysed from political and military standpoints to assess the practicability or otherwise of India embarking on a nuclear weapons programme. The issues involved are not as simple as they might appear at first sight.

It is the acquisition of both strategic and tactical nuclear weapons that confers the optimum capability and credibility.

Tactical nuclear weapons by themselves, with comparatively limited capability, would not ensure security. The choice, therefore, is between switching over to a full-scale nuclear military posture, with all its attendant political, financial, economic, military, human and other implications, and retaining the conventional military posture. A half-way measure, with all its limitations but entailing the same degree of escalation and retaliation risks would be politically and militarily unsound.

CHINA'S STRATEGY

Chinese use of strategic nuclear weapons against India appears to be unlikely. Primarily, China's nuclear posture is now mainly directed against Russia. There is no evidence that China possesses tactical nuclear weapons; and, in the Sino-Indian context, this is bound to receive low priority as China believes that it has the necessary conventional armed potential to achieve the same results without resort to any form of nuclear confrontation.

Pakistan may explode its first nuclear device within the next two years. But it lacks the infrastructure for a sustained nuclear programme. The possibility of its acquiring any nuclear capability, leave alone credibility in military terms, even during the next decade would appear to be rather remote. Mere fabrication of a few nuclear weapons over a period of time should not lead us to overestimate its nuclear capability.

There is no doubt that its aims in trying to acquire nuclear military capability is to restore the balance of power on the sub-continent. With assistance from the USA and China and financial support from Saudi Arabia, Pakistan is re-arming itself to a point of saturation on the pretext of meeting an imaginary threat from the Soviet troops through Afghanistan or by the Soviet-backed Afghan army. If and when there is a political settlement in Afghanistan, the accretion of military hardware and the additional forces raised will be used in any future conflict with India, notwithstanding the USA's assurances to the contrary. The Reagan administration has given sufficient indication of its interest in making Pakistan the lynch-pin of its strategic military policy in the Gulf region to counterbalance the Soviet presence in Afghanistan.

Such military aid Pakistan will receive will not be without "strings", one of which will be aimed at weaning it away from its military nuclear ambitions. The USA does not want India, Israel and other Arab nations to upgrade their current nuclear status in a region already seething with high tensions. It would want to defuse political and military tensions in West Asia and the Gulf regions to ensure an uninterrupted flow of energy resources not only to sustain its own economic potential but also that of its Western allies and Japan. More important, any nuclear misadventure by Pakistan against India or in S.W. Asia, or any prospect of Pakistan making available its limited nuclear arsenal to some militant Arab nations in their anti-Israel confrontation, would draw the USA and its NATO allies into a nuclear imbroglio with the Soviet Union.

Geopolitical considerations apart, there are many important military factors which need to be taken into pragmatic consideration before it is decided that India should embark on a nuclear weapons programme. It would involve de novo reorganization of the armed forces in order to carry out a nuclear threat or to be able to meet one. It would imply new combat doctrines, complete reorientation of training, and developing the highest quality of command leadership at all levels.

Other requirements would include measures to ward off the many-sided effects of nuclear fall-out: covered vehicles, such as tanks and armed personnel carriers, which can absorb a certain amount of radiation from low-yield weapons for the troops to traverse through or across a strike zone; a highly efficient intelligence system backed up by an equally efficient surveillance system to pinpoint targets and monitor the results of a strike; effective delivery system(s); a medical set-up geared to nuclear science and medicine; and a speedy and reliable intercommunication system of the type provided in space flights.

SURVIVAL PROBLEMS

This is not to forget the measures that would be necessary against nuclear retaliation such as shelters for civilian population, survival rations, enormous fire fighting resources of the most modern type, and civil and military hospitalization facilities on an unprecedented scale. All these and more will require vast material resources and financial outlays, great and sustained ingenuity in science and technology, and a solid economic and industrial base. These gigantic tasks may be beyond even highly developed nations, leave alone a developing one like India.

What is applicable to India is equally applicable to Pakistan; the latter is in a far worse position to undertake these tasks. More possession by Pakistan of a few crudely fabricated nuclear weapons, without any solid and sustaining infrastructure, must not distract Indian attention from the dangers of a programme to achieve nuclear military capability.

There are three options open to India in the current situation. First, to acquire unclear weapon credibility. Secondly, to maintain the existing conventional deterrent, notwithstanding the assumption that Pakistan in the near future may manufacture a few nuclear weapons. Lastly, while keeping the second option open, to obtain some form of effective nuclear guarantee or protective shield from a friendly nuclear Power.

The overwhelming military implications of the first option have already been outlined. While it is possible to argue that this option will put India and Pakistan on equal nuclear military terms, thus minimizing the prospects of a nuclear confrontation, it is but one giant first step towards the proliferation of these weapons on the sub-continent. The political, financial, economic, industrial and scientific and technological fall-out from this option needs to be assessed against the nation's socio-economic objectives for the millions living below the poverty line. This is apart from the untold devastation and suffering this option may bring in its wake on both sides of the border.

As for a nuclear guarantee, it would mean subordination of our political and military independence or freedom of action to that of the guarantor. It would also imply that we would be compelled to accept the Nuclear Non-proliferation Treaty. Both would impinge on our sovereignty and national interests. Any suggestion that it might be desirable to seek a protective nuclear shield from the Soviet Union is not pragmatic. Firstly, Russia may not risk its own security in view of its own domestic and global compulsions; secondly, any such guarantee or shield would be tantamount to be a military alliance which would dilute our non-aligned status; and thirdly, it would, in the context of Pakistan's own political and military links, greatly accentuate nuclear escalation and retaliatory risks.

NATIONAL MORALE

It would perhaps be well to remember that we have been able to withstand the Chinese nuclear military posture and credibility for over a decade with political sagacity and resoluteness as well as with our moral strength and our consistent and widely accepted stand on nuclear disarmament. There is, therefore, no reason to believe that our stand against Pakistan, if and when it acquires nuclear credibility, should be dissimilar. The best and surest guarantee for India is self-reliance, based on the firm will of an economically strong and united nation.

The theory that possession of nuclear weapons by Pakistan would lead to political or military blackmail is not entirely valid. Possession of these weapons by a country does have an impact on those that do not have them, but the bluff can be called by the strong will and high morale of a nation. After all, the possession of nuclear weapons by the Super Powers did not alter the course of recent wars in Vietnam and West Asia.

Pakistan's impending acquisition of nuclear military capability need not, therefore, make us panicky. Let there be a thorough reappraisal in depth by the Government and the Chiefs of Staff. Let there be a rational debate at the national level on all the relevant factors involved. Despite the clamour for the bomb, let us be pragmatic in our evaluation of our national security posture in its totality.

CSO: 5100/7106

HEAVY WATER SCARCITY IMPEDES NUCLEAR POWER PROJECT

Madras THE HINDU in English 12 May 81 p 8

[Article by S. Parthasarathy]

[Text]

ATOMIC energy is new. There is, however, no greater mystery about it than about any other source of power.

But what is happening at Kalpakkam is bordering on mystery. It was here that India's third nuclear power station was supposed to have gone into generation several years ago. It was here that the future pattern of atomic power generation was intended to be determined. It was again here that a breakthrough was hoped to be achieved on a very wide area of nuclear technology. What has happened to all these expectations?

There is a hush hush with neither the Government nor the Department of Atomic energy willing to take the public into confidence on the technology, impediments or other details concerning Kalpakkam or other atomic energy establishments.

The DAE has been saying that the schedule of the Kalpakkam project depended on the satisfactory performance of a number of industries, organisations and agencies manufacturing items for a nuclear power plant for the first time in India. Is the current delay attributable to default on their part?

The answer is a "no", as is obvious to any visitor who sees in this once abandoned and forgotten village a complete atomic power station in shape—dome structures, turbine buildings, chimney stacks, distillation columns, seawater intake structures (condenser cooling), jetty, pump house and heavy water upgradation plant—there can be no mistaking these for anything other than a nuclear power station.

Even the fuel—natural uranium dioxide—has been fully charged for the first reactor. Two years' supply has been received at the site. Only, it is not in generation. Instead of delivering power to the State's power systems, it has been taking power from the grid. In fact, the State Government, in its successive power budgets, has taken credit for supply of power from Kalpakkam. Engineers, technicians and workers have certainly done their best to make the gigantic effort a success—in an unreal sense as yet.

The hurdle

What is the constraint? Enquiries point to non-availability of heavy water as the hurdle.

Fast fission neutrons travelling at 42,000 kms. per second must be slowed down or moderated to 1.8 kms. before fission can occur and sustain a chain reaction. This slowing down of fast neutrons is accomplished by collision with molecules of heavy water which is the moderator. The fuel-moderator arrangement in the reaction taking place in the reactor core characterises the CANDU—PHW (Canadian Deuterium Uranium pressurised heavy water cooled) type reactors.

The farthest any spokesman of DAE would go is to declare that plans for commissioning the first 200 MWe unit are under way and every effort is being made to provide all the necessary inputs for starting operation sometime in 1982.

It would be interesting to examine the heavy water scenario in some detail. Against an installed capacity of 280 tonnes/y, hardly 30 or 40 tonnes are produced in Tuticorin and Baroda, among other places and that too at below nuclear grade purity.

The demand on the meagre indigenous heavy water production is quite considerable coming, among others, from the Rajasthan Atomic Power Project units for make-up. RAPP I had to depend on Soviet heavy water for its initial charge (about 220 tonnes).

The make-up consumption is enormous as the technologically outmoded (it is at least 20 years old with vastly improved versions available internationally) reactors lose large amounts of the moderator through leaks. It is not difficult to calculate how long it will take to accumulate enough heavy water for the initial charge for the first Kalpakkam unit after meeting the needs of make-up for RAPP units. The immediate prospects thus appear bleak whatever the Department spokesmen may say.

There is a view among engineers that India could agree to some sort of international inspection if that would fetch it enough heavy water at least for the Kalpakkam and Narora plants. "Heavens are not going to fall if we do that" is the observation of the Chairman of the Andhra Pradesh Power Board, Mr N. Tata Rao. Others sharing this view feel that while building up indigenous skills is a long term and continuous process, in the short run foreign collaboration, with all that it means, would relieve the country of the recurrent power crises facing it.

Mr M H P Rao, Chief Project Engineer, MAPP, is sure the moment heavy water is made available to him, he can start the first unit and, after some months, the second unit also.

It is not clear even to engineers of the Department what interests are served by refusing foreign inspection or how India's atomic energy programme would suffer if the nuclear installations are thrown open to international inspection on a selective basis.

Can it be that Indian safeguards procedures are lax and there is a desire to hide something in our installations? It cannot be, obviously. According to the DAE, before the U.S. started insisting on fullscope safeguards, that country's inspectors did find the procedures at Tarapur praiseworthy.

Big source

Unavailability of power has clearly constrained economic growth. Given the close relationship of energy supply to economic growth, India has to have in operation quickly all the major types of electrical power plants. It has limited energy resources and naturally looks forward to nuclear power as a possible big supplementary source. With its large reserves of uranium and thorium India is particularly well-equipped for the development of nuclear power.

Considering the hurdle posed by heavy water in retrospect, there are those who doubt the wisdom of adopting the heavy water moderated Canadian type. Following the 1974 blast, Canada terminated supply of all sensitive materials for the Kota plant. This put new blocks on the Indian nuclear road and the nation's programme suffered a grievous setback and now India seems to be completely off the track.

Originally, the aim was to have in operation as much as 3,000 MWe of nuclear plant by 1980. Today, there is hardly 800 MW in terms of installed capacity.

Spokesmen of the Department point out that the Government has not changed its policy of adopting the type for the first generation reactors. Three more atomic power stations—one each in Gujarat, in the Northern and the Southern regions—have been announced, and the Gujarat location has also been decided. While admitting to past lapses on the heavy water front, they say the past mistakes will keep them away from similar errors in the future heavy water programme.

A number of heavy water projects have been sanctioned or are being sanctioned including two in Thal and Gazra (huge fertiliser project locations using natural gas from Bombay High). They promise the use of correct technologies this time. This means that only Kalpakkam and, to a lesser extent, Narora, will suffer this undue delay in commissioning. One can, therefore, forget Kalpakkam for two years and possibly longer.

At present, the major nuclear fuel resource used in India is natural uranium. This resource can be rapidly depleted if construction of nuclear power generation facilities advance significantly. The long range atomic power programme has therefore been based on the country's rich thorium resources.

What is happening in the adjoining complex in Kalpakkam has significance in realising the long-range aim. It is interesting to listen to talk of exotic fast breeder programme leading to establishment of thorium-fuelled power reactors in the early years of the next century.

A fast breeder test reactor (FBTR) is being designed drawing upon the experience of the Rapsodie Fortissimo reactor in France. The FBTR will serve as a test bed for irradiating and testing materials and fuel for future breeder power stations. All the facilities, according to Mr N. Srinivasan, Director of the Reactor Research Centre at Kalpakkam, will be ready in two years when the FBTR will be in operation producing incidentally 14 MWe of power.

Plutonium recovered from the spent fuel in CANDU reactors is a valuable nuclear material required to fuel advanced breeders which have the potential of using thorium. A Rs. 50-60 crore re-processing plant has been sanctioned for Kalpakkam which will handle the spent fuel from MAPP units and the FBTR. Preliminary work has started on this. It is pointed out that reactor systems such as those available in MAPP have the greatest potential for production of plutonium per MWhr.

The Government has reposed confidence in the work going on at RRC at Kalpakkam and has asked the Centre to prepare a blueprint for a fast breeder power station of 200-500 MWe.

Fast breeder technology must take decades to master. If in the meantime India goes in for more nuclear explosions, it is unlikely to find collaborators or even material suppliers. Indian scientists and technologists would have to depend on their own intellectual resources.

Observers of the atomic energy scene know that Indian scientists are quite sound in theory. It is engineering back-up and production engineering that do not appear to be particularly strong.

If a large number of natural uranium-fuelled power plants are not operational in the next few years making available enough spent fuel from which to recover plutonium, if the second stage reactors using plutonium and uranium (on which development work is proceeding at RRC) are not in generation in the nineties, the ultimate stage involving use of the abundant thorium reserves cannot be a reality in the early years of the next century and India can forget nuclear power, in the view of these technical observers.

CSO: 5100/7104

JAPAN

BRIEFS

NUCLEAR ENERGY REPORT--Tokyo, 5 Jun (KYODO)--A report recommending the construction by 1990 of a commercial plant to enrich uranium capable of supplying 30 reactors each with a capacity of 2 million kilowatts of electricity, prepared by the Nuclear Subcommittee of the National Resources and Energy Agency's Advisory Committee for Energy, was handed to International Trade and Industry Minister Rokusuke Tanaka 5 June. It stressed that strenuous efforts should be made to avoid accidents such as those that occurred earlier this year at the Tsuruga nuclear power plant and called for a large-scale expansion of the nuclear industry in the next 10 years in order to establish Japan's own nuclear fuel cycle and ensure against energy shortages. It also recommended a prototype plant and a commercial plant following the pilot plant under construction at Ningyo-Toge Pass, Okayama Prefecture, and the disposal of low-level radioactive waste on land with the approval of the local residents around 1985. The report said technological developments should be expedited to take in high-level radioactive waste produced in reprocessing used nuclear fuel in Britain and France and to be returned beginning in 1990. [Tokyo KYODO in English 1106 GMT 5 Jun 81 OW]

CSO: 5100/2275

CASTRO MADERO REAFFIRMS CONTINUITY OF NUCLEAR PROGRAM

Buenos Aires LA PRENSA in Spanish 30 May 81 p 5

[Text] The 31st anniversary of the creation of the CNEA [National Atomic Energy Commission] was celebrated yesterday, along with National Atomic Energy Day, at a ceremony at the CNEA facility in Ezeiza. The CNEA chairman, Vice Admiral Dr Carlos Castro Madero, gave a brief account of what has been accomplished and the work now in progress. He made it clear that despite the limitations imposed by the present economic situation, and despite the "strong pressures placed on us from abroad," and the high level of financial commitment required from the nation, "the goal of the CNEA is clear: to complete the nuclear plan, in the least possible time, with the highest level of quality, with the greatest amount of national participation, and at the least cost. The goal is a difficult one, but we will achieve it."

He added that "there is no little amount of austerity or small savings entailed in this effort. We must do all we can in the public sector. Every time that one of us manages to avoid an unnecessary cost and can improve efficiency in any job, he will be contributing to the nation's well-being."

The Ceremony

The ceremony, which was attended by former chairmen of the CNEA, directors, special guests, and CNEA staff, opened with the national anthem.

Vice Admiral Castro Madero then spoke, and after his report, medals were awarded to staff members who had completed 20, 25, or 30 years of service with the government.

A Reminder

In his opening remarks, the CNEA chairman spoke of deceased CNEA personnel, stating that this was also a suitable opportunity "for ratifying the CNEA's commitment to respond with deeds to the confidence and material support it has received from the national government and from the nation as a whole, and to the confidence placed in us by the fraternal nations of Latin America, which have entrusted us with the responsibility for sharing in research and development of nuclear projects."

Evaluation

After stating the CNEA's intention of evaluating, "not just by listing the projects completed or begun, but also by examining in depth the rate and means of execution of the various jobs, giving special attention to how the national funds entrusted to us are being used," he discussed the CNEA's most recent activity.

He reported that the operation of the Atucha I power plant continues to be a "reason for great satisfaction. We can now say that from 25 October 1980 to 20 February 1981 it completed the longest period of uninterrupted operation since it began to operate, and it was just a few days short of breaking the world record for uninterrupted operation of a nuclear power plant."

For Atucha II, "we have reached agreements with the AECL [expansion unknown] enterprise, thus eliminating a number of bottlenecks that had been delaying construction of the plant. We have also assumed the role of prime contractor for construction in the nuclear area, which has brought about a greater advance in this work. For that reason, we now think that the plant will be able to generate energy in the last quarter of 1982. Contracts and agreements have been signed for construction of our third nuclear power plant and for the first heavy water plant, which is a key element in an independent nuclear program. We have signed all these contracts unconditionally, without infringing on our sovereignty or restricting our freedom of action, despite the strong pressures brought to bear on us from abroad."

He then pointed out that "through these agreements and contracts the CNEA has assumed responsibility for directing the construction of the Atucha II nuclear power plant. This will significantly boost our national capability in the areas of design, equipment installation, assembly, and operation of nuclear power plants. For this purpose a mixed energy company, ENACE, has been established. The majority of this firm is held by the CNEA; it will be a fundamental tool for achieving this objective. As we all know, our responsibility is not limited to strictly internal CNEA matters, but in order to safeguard our nuclear plan, we have to promote the Argentine nuclear industry. We have taken a great step forward in this area with the signing of a contract with the firm IMPSA [expansion unknown] for the manufacture of two steam generators, three cooling units for the moderator, and the pressurizer for Atucha II. This marks the beginning of the manufacture in Argentina of large nuclear components, and is a significant move forward along our long course toward self-sufficiency in this field."

Fuels

On the subject of fuels used for the operation of the power plants, he said that "in the area of the fuel cycle, we can take pride in creating a new production record for yellowcake (220 tons), for which the processes have been improved."

"Furthermore," he continued, "the meetings held in Buenos Aires of the group of nonaligned nations which are coordinating their efforts in the nuclear field have had a positive effect. They have significantly helped to unite opinions in the area of international nuclear policy, with results that we feel are highly favorable toward our position."

"I think it is very important to point out also that through the INVAP [expansion unknown], we are creating a pole of technological development in Pilcaniyeu, based on developments in extractive metallurgy. Just the mention of what we are now doing in Patagonia should stir us to take pride and satisfaction as Argentines and as members of the scientific and technological community."

Containing Government Spending

In speaking of the present economic situation, he said that "we have had to overcome a number of problems in carrying out the jobs I have mentioned. Despite these problems, through the efforts we have made in the industrial production of fuel elements, we can now produce one fuel element per day and we have totally integrated the process of manufacturing zircaloy tubes."

"In the sector of radioisotopes and radiation, although demand for radioactive materials has increased by 43 percent, its activities have been outstandig in their contribution to the improved health of the population, through agreements made with national public health authorities and with equivalent authorities in the provinces."

He said that the rapid construction "of the heavy ion accelerator that is being built at the Constituyente Atomic Center is proceeding at a rate that deserves the highest praise. This project will provide us with a scientific tool to maintain and raise our international standing in the field of the physical sciences, thus rejecting the simplistic and mistaken concept that research in nuclear physics is too expensive an activity for Argentina."

He also reported that "the advances at the research and teaching reactor at the Bariloche Atomic Center are both rapid and effective. This reactor is designed for nuclear engineering. With it, we will be able to train our future nuclear engineers thoroughly and completely. This task of training human resources has been aided by the development of a postgraduate course in nuclear engineering offered at the Faculty of Engineering of Buenos Aires.

International

In the international area, he mentioned as "outstanding the fact of adhering to the time schedule established for the Peruvian Atomic Center," and the signing of nuclear cooperation agreements with the appropriate Brazilian institutions, as well as with Uruguay for "the joint development of a feasibility study for a nuclear research center."

The government authorities have constantly acted to meet the budget requirements for the nuclear plan. This is a noteworthy fact, as the policy of containing government spending will affect the rate of execution of some projects. "On this I want to be clear and frank. I want each member of the CNEA to understand and to share with me the profound conviction of the need to make an extra effort to comply with a policy that will allow no room for deviations or desertions."

Vice Admiral Castro Madero spoke of the need for savings and for adopting austerity measures, but without abandoning the plans now being carried forward.

In closing, he thanked and congratulated the staff members who have completed 20, 25, and 30 years of service. They were given medals which were previously blessed by the priest, Eliseo Natta, from Christ the King Parish, who offered a prayer in memory of deceased CNEA staff members.

7679
CSO: 5100/2268

FUTURE OF NUCLEAR ENERGY DISCUSSED

Mexico City EL GALLO ILUSTRADO in Spanish 26 Apr 81 pp 6-10

[Interview with Antonio Ponce, industrial management secretary of the SUTIN [National Nuclear Industry Workers Union]; date and place not given]

[Text] In order to carry out its reactor program, the ININ [National Nuclear Research Institute] must be supported by a program for the production of heavy water and fuels, the technological development of fuels, metallurgy and other factors. Also, a fuel cycle program must be developed by URAMEX [Mexican Uranium].

In connection with the ININ development program, a reactor is being built which will provide knowledge very basic to reactor development. That being built will have zero power and will be installed in the reactor engineering center. Next there will be a low-power, 40-megawatt reactor, which is only in the design stage, and the prototype reactor.

This project is being coordinated with the CFE [Federal Electricity Commission] program. When the low-power reactor is completed, we will already be in a good position to participate in the plants which will probably be built at Laguna Verde, to supplement that which is now being completed by the year 1990. Simultaneously we are working to develop a natural uranium line. We need to develop heavy water. Currently a small plant, a pilot plant, has been built in Salazar, but following it there will be a plant, probably experimental or industrial, which has not as yet been technically defined.

Where fuel is concerned, a pilot plant for the production of fuel for the subcritical reactor and the zero-power reactor is almost complete.

In metallurgy, work is proceeding, but there is an urgent need to intensify the development of some strategic materials for the nuclear industry such as zirconium, steel, aluminum and lead, which are important.

In addition, the ININ has a program which must be pursued for thermal hydraulic circuits, instrumentation and control of all of the electronic elements in the plant. Uranium prospecting and exploration are underway throughout the country. The Pena Blanca installation is the first plant for the processing of uranium to be built, and it will provide recharging for Laguna Verde. Then there is the La Coma plant, on which the prefeasibility studies to be approved by the federal government will be completed in another month, and it is almost a certaintly that it will be built.

This is the whole of the energy and nuclear program of Mexico. It is important that none of these lines fail, for if one does the project would be crippled. The reactor aspect is of particular importance.

This low power reactor is not being built in Salazar because there are minimal cooling and space requirements which Salazar does not meet. We can only supply 20 liters of water per second, which is negligible. Much more is needed for the low power reactor, since it requires a flow of 1,000 liters per second.

If we are to build the low power reactor in a site other than Salazar, the whole reactor development line must be together. The idea is to centralize the energy aspects of the ININ once and for all in this center.

[Question] What is the significance of the reactor center?

[Answer] Mexico's nuclear-electric program is to have its own technology, autonomously, so that we can make decisions without depending on foreign countries. This is the basis of the importance of this program for the development of technology in the energy sector.

If we are to move forward, we cannot do without a reactor engineering center. It represents the possibility of our country's having its own technology. Not having the center would mean dependence on foreign countries to a considerable extent. In economic terms, we are speaking of dependence which at current prices would mean the payment of about 700 billion pesos by the end of the century. In strategic terms, this means dependence on other countries for the installation of all of our plants, for obtaining replacement parts and for maintenance.

[Question] How did the idea of the center develop? Why Patzcuaro and not some other site?

[Answer] The proposal exists because the SUTIN is promoting it, instead of the ININ. For about 10 years the SUTIN has been waging a battle for the development of the nuclear industry in a national form, and it has set forth a series of measures to achieve this end, beginning with the definition that the state enterprises should develop on their own.

The SUTIN has urged that the nuclear-electric program be based on natural uranium, and on a more detailed basis, it has urged the development of a whole nuclear technology. We nuclear industry workers believe that we have a responsibility to the country. As a trade union we are committed to nothing more than carrying out tasks in defense of labor and labor affairs. However, we must fight for the development of the country, and in particular for adequate development in the nuclear sector.

The development of reactor engineering comes within this framework.

As to Patzcuaro, when we saw that it was necessary to install the low power reactor and that this was not possible in Salazar, the idea of establishing a whole nuclear technology development center at the site where the low power reactor could be installed was conceived.

How was the site selected? Well, it was relatively simple. First, we know that a reactor of this type does no damage to the region, to the site itself or to the region where it is installed, and this is not only theoretical but seen in practice in the Salazar experience. On this basic criterion, a series of requirements, both technical and of other types, was established for the search for the proper site.

What was needed was a site where there was sufficient water, where the seismic activity was not excessive, where the prevailing winds will not blow in the direction of a major settlement, and where demographic density is not very high--in a word, a series of criteria and norms for the selection of any reactor center site.

In addition, a site near Mexico City is needed so that communication between the personnel at the center and at Salazar can be as easy as possible.

It is also important that the center be near a provincial university. For this reason the states of Puebla, Morelos, Queretaro and Michoacan were studied with a view to finding adequate sites. In order to determine which was the best, they were classified according to their technical characteristics, and the highest score was the site on the shore of Lake Patzcuaro. As we know that the center will cause no damage, there was no reason to discard this site. We continue to be convinced that the center will do no harm either to the lake or to aquatic life, much less the population.

Everything which has been said to the contrary has an empirical basis. I am amazed by the cynicism with which many statements, for example that the reactor will evaporate large quantities of water, are made. I do not know where they get these figures, since people do not have access to the plans for the center. People should be more responsible.

[Question] Can it be demonstrated that the center will have no negative effects?

[Answer] Yes. The factors which have been seriously considered are three: heating of the water, possible contamination by radioactive materials, and the destruction of plankton. Where the warming of the water is concerned, the temperature of the liquid in the reactor only increases 9.5 degrees centigrade, and in the process of returning to the reservoir, the water is cooled somewhat. But even presuming this not to be the case, it would take 15 years to change the temperature of the lake by two-tenths of a degree, which is a very small difference compared to the normal variations between summer and winter, which amount to 7.5 degrees.

However, this will not happen. What we are planning is not to return the water directly to the lake but to design a cooling circuit allowing the water to reach the lake at a temperature practically equal to the initial level. There are various choices for using the water. For example, Figure 1 shows a serpentine in which the water is cooled. Or a retaining dam could be built in which the water would be stored for a time to lose part of its heat.

In the extreme case, if very exact calculations show that none of these options are viable, a cooling tower would be built. With this method it would be possible to cool the water even more than is needed, and the tower could be designed so that the water returns to the lake at the temperature at which it is taken out. The problem is a technical one and the solution is easy.

The second problem which has been discussed is possible radioactive contamination. In fission, uranium produces some particles which are called fission products and are radioactive. They remain confined in a fuel capsule, and this is made of a ceramic which is very hard, and all that can escape into the fuel sheet or jacket is the radioactive gases. I.e., they remain in little tubes which are made of a material such as stainless steel.

There is no leakage from these tubes. If there were contamination, it would not be of the lake but within the reactor, if one of these tubes should develop a crack. Such cracks are more or less normal and occur in power reactors such as those at Laguna Verde, but they do not occur in research reactors. It would be hard for them to occur in such reactors because the operating conditions are much stricter.

And presuming that a crack of this type did develop, there would be an escape of radioactive gases to the primary cooling circuit, which is within the reactor itself, which the water never leaves. Figure 2 shows the heavy water, and it is here that the gases produced by fission would remain. However, the moment they begin to move into the primary circuit, the detector sounds the alarm and the problem is immediately corrected.

Let us suppose the problem is not corrected, that a crack occurs first, and second that the problem is not corrected, because the monitor fails or is ignored. Then another crack would have to occur in the heat exchanger which links the primary circuit with the water coming from the lake. All of these things would have to happen before contamination could begin, but another detector would register this and give the alarm so this problem could be corrected.

It would be extremely difficult for such contamination to occur.

Plankton die when the water passes through the reactor and its temperature is increased by 9.5 degrees. However, we must examine what quantity dies. First of all, the water which passes through the reactor is a minimal fraction. In 24 hours of continuous operation, 2/10,000 of the volume of the lake would pass through the reactor, so 2/10,000 of the lake plankton would die in one day. This is negligible when we realize that plankton reproduce at a very rapid rate. On a sunny day, for example, the volume of fitoplankton may double. In other words, if we remove 2/10,000 in one day, normal reproduction fully reestablishes the balance.

Foreigners Opposed to Development

There are foreigners living in the Patzcuaro region, and obviously, the technological development of the country is of no interest to them, or if it is, it is in a very secondary way. They are attacking the establishment of a reactor research center without knowing all the background of our country, its development and its dependence, and even when they understand these things they cannot feel them as we Mexicans do. I believe that their opinion on these matters may have some value, but from the political point of view it has none at all.

We are hoping that the government of Michoacan will make its views known first of all, because it will be the body which will evaluate the regional opinion. We are also interested in the views of the inhabitants of the community of San Fe, who are the people affected since the land is theirs, and the number of hectares to be used involves them.

We are holding discussions with the people of the region and are explaining the real implications of the project to them. Once there is acceptance on the part of the residents and the government of Michoacan, the decision will then fall to the Secretariat of Patrimony and Industrial Development. We hope that there will be a decision by the end of May, because otherwise aspects of the project will begin to lag.

I would like to mention that we are not bound to the idea that Lake Patzcuaro should be the site. It is simply that Lake Patzcuaro proved to be the most favorable, and as no one has informed us to date of any reason it would not be desirable to build this center there, we continue to plan on this site. If there is any valid reason to go elsewhere, we will. We have no special interest in that zone. It has been mentioned that Lake Patzcuaro has a very high sentimental value for the people of Michoacan. If this is the case, we will accept the situation and go elsewhere. However, the arguments have been very different.

The energy program calls for an installed electrical capacity of approximately 90 million kilowatts by the year 2000. Of these, 20,000 megawatts can be provided by nuclear energy. The type of reactor to be used has not yet been defined, and it seems that the use of a combination of the two types of energy is recommended. It is not stated explicitly, nor is it evident, whether natural uranium or enriched uranium is intended. We can presume that the energy program calls for 10 million kilowatts from natural uranium and 10 million kilowatts from enriched uranium. For it is said that a combination of the two will provide a broader field for maneuvering, greater flexibility and will insure technological self-determination.

However, these concepts make no sense pleasing either those who favor natural uranium or those who favor the enriched form, because I cannot see how the flexibility we must have can be achieved with two types of reactors. This flexibility raises other questions, not the combining of two types of reactors, but achieving mastery of a technological line, and this we can achieve better with a single line than with two simultaneous ones. What the use of two different lines at the same time would mean for us would be first of all great difficulty in development of the technologies, because nuclear technology is sophisticated in itself, one of the most advanced in existence.

Adapting one of these technologies to our country will require of us a great effort, the use of all the resources we can muster and it will be an arduous task. If we want to develop two at the same time, we would have to double the effort and this makes no sense.

We want to develop the technology in the country and we want to establish a capital goods industry, it has been said and reiterated. If in the energy program we work with two lines simultaneously, on the one hand we must divide the resources in half, which will not create a healthy industry, while on the other hand the difficulties will be doubled.

For the purposes of a program for technological development in the nuclear field, Laguna Verde cannot be relied upon, for it has contributed no advance in technological development.

I think that from now on we must develop a program perfectly planned from the beginning with great care in all phases, and in a relatively short time, so that when the fourth or fifth plant is installed, we will already have a really substantial level of national participation, let us say 80 or 85 percent. Various other countries, Argentina and India, have done this, and we can too.

With enriched uranium we have the problem of the fuel cycle, which will always mean dependence. I am speaking of a very long period, until the end of the century, because it would not be desirable for us to develop uranium enrichment first of all. Development of a mixed uranium technology would take us a long period of effort. To transfer it here from another country is a utopian dream, because no country will do this for strategic and economic reasons, and so it is an illusion to say that we will bring the technology from another country.

To date no country has offered this technology to another. It is true that we can negotiate technology, but not just any technology. The technology for uranium enrichment is one used for producing atomic bombs and it is not traded even for oil. The fact that we could create an atomic bomb of some type is a hindrance, and this path is practically closed. Presuming that we obtained the technology, building an enrichment plant would cost about 2 billion pesos. How can we imagine that a country like Mexico could make an investment of this type, since we would not even have the capacity to use it fully in the energy program, because it would suffice to supply eight energy programs of the kind the Mexican government is planning. This would cause heavy dependence, not only economic but political as well; this has already been seen with the first charge at Laguna Verde, and in the case of Salazar, with the embargo on uranium for the research reactor. Although it is denied, the reactor does not have its enriched uranium and it does not function.

Currently there is also talk of rapid plutonium reactors, but this is a long-term prospect, not only in Mexico but throughout the world. There has been great avoidance in Mexico of reactors of the breeder type which produce fuel on the basis of thorium. These offer prospects for the country, and not the rapid reactors with plutonium, because these reactors are similar to the present natural uranium reactors, in other words to proceed from the natural uranium reactors to reactors using thorium, we would require a modest effort. Apparently Mexico is very rich in thorium.

If we wish to be self-sufficient in terms of the raw materials the energy industry uses we must find uranium. Some persons believe that there should be no nuclear program for electricity until we have the reserves necessary to supply the program, but this is never done in any industry. For example, when an industry is built it is assumed that raw materials will be available with a certain reliability throughout the life of the plant. Purchasing all the raw materials beforehand is a dead investment. What should be done is to plan the exploitation of uranium on the basis of the nuclear-electrical program, and both exploration and exploitation should be pursued as the requirements develop.

[Question] Dr Dalmau told me that work is already being done on the nuclear-electrical program.

[Answer] We know that work is being done, but it has not been finished. It is very discouraging that the plan is not complete because until there is a nuclear-electric program, almost nothing can be planned. It is not possible, for example, to plan the training of technicians. If we undertake to train people and then the program is not finished or is limited, what will we do with this trained personnel?

[Question] Why has there been such a delay in the making of this decision?

[Answer] Various factors have had an effect. One is the obvious problem of the six year government terms. On the other hand, I believe that the solution in our country depends on the debate about natural uranium versus enriched uranium, which has never been resolved.

[Question] How many nuclear-electric plants would we need to build in order to produce the 20,000 kilowatts?

[Answer] It depends on the size. There are plants of 600, 800, 1,000 and 1,200 megawatts. If natural uranium were used, the plants would probably have 600 or 800 megawatts. We would need some 30 plants. If the plants had larger reactors than are currently being built, for example 1,200 megawatts, we would need some 15 reactors.

[Question] What is the capacity of Laguna Verde?

[Answer] There are two 654 megawatt reactors. In all, Laguna Verde will have 1,308 megawatts.

[Question] What would be the ideal, to build more plants or to build a plant of intermediate size, bearing in mind the site where it will be built and the danger?

[Answer] Various factors come into the determination of the size of each plant. On the one hand, it is presumed that the largest are the cheapest, but on the other hand our country has a modest industry. It would be easier to produce small components than larger ones. From the point of view of the participation of our national industry, smaller reactors would be desirable. I think that 600 or 800 megawatts is the size best suited to the country.

If we make small reactors, it means that to achieve the same capacity we need a larger number of components. For example, if a reactor needs certain pipes, and if we have 30 reactors instead of 15, we double the demand, and thus it would be much easier to establish an industry manufacturing this pipe.

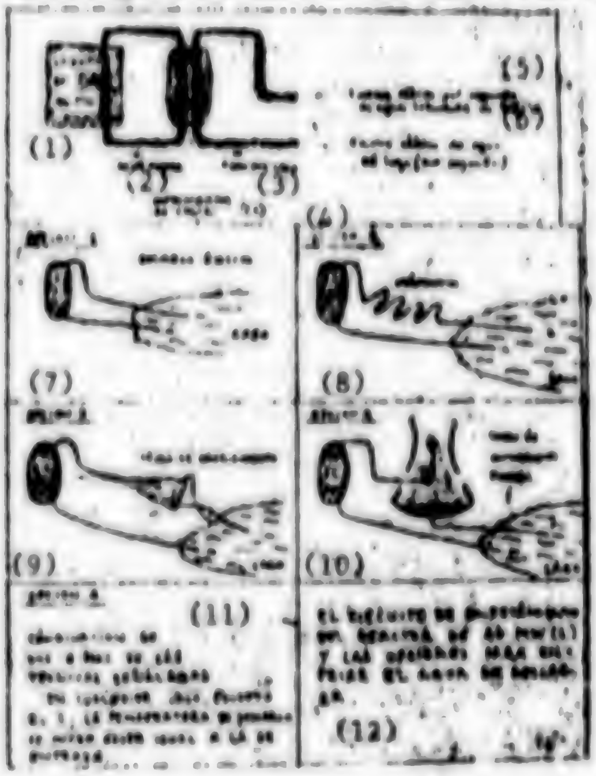
Some people believe that we should not have such a sophisticated industry as this, that we could guarantee simpler ones. However, we believe that the nuclear industry is very important because it is a leading technology which makes possible many others.

Developing nuclear technology promotes the development of metallurgy, high-quality precision machinery industries--factors which can provide the country with a much better industrial plant in general and which can come to be competitive with those of other peoples.

[Question] Do you believe that in the nine [sic] years remaining in this century it is possible to build nuclear-electric plants with the small reactors we will need?

[Answer] Yes it is possible, but the important thing is for us to do it ourselves. With the oil resources we have we can buy 20,000 megawatts abroad until the year 2000 with what is paid us for the oil. But what we want is to develop our own nuclear industry.

Figure 1. Cooling Alternatives for Low Power Reactors

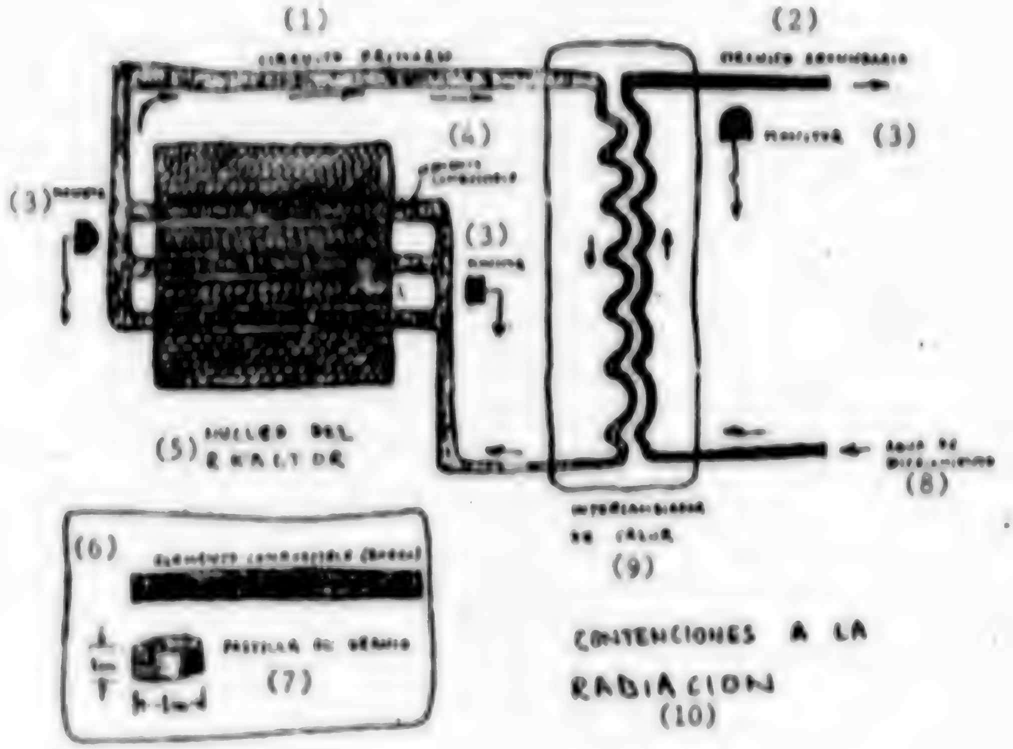


Key:

1. 40-megawatt reactor
2. Heavy water
3. Water from the lake
4. Heat exchanger
5. One cubic meter of water per second heated by 9.56 degrees centigrade
6. One cubic meter of water per second from the lake
7. Option one: direct discharge; lake
8. Option two: serpentine
9. Option three: cooling dam; lake
10. Option four: [illegible] cooling tower; lake
11. Option five: combination of two or more of the techniques described. In all cases except for no 1, the temperature at discharge can be made equal to that on entry.
12. The cooling circuit for a 40-megawatt reactor and the options for cooling the discharged water.

[Note: the shaded ovals in the four center sections of the chart represent the heat exchanger.]

Figure 2. Radiation Containment in Low Power Reactors



Key:

1. Primary circuit
2. Secondary circuit
3. Monitor
4. Fuel element
5. Reactor core
6. Fuel element (rod)
7. Uranium capsule
8. Cooling water
9. Heat exchanger
10. Radiation containment

Comparative Analysis of the Characteristics Studied

AREA (1)	HIDROLOGIA (3)	GEOLOGIA (4)	SISMOLOGIA (5)	USO DEL SUELO (6)	DEMOGRAFIA (7)	METEOROLOGIA (8)	EVALUACION (9) FINAL
FACTOR DE PESO (2)	1	0.8	0.8	0.4	1	0.8	
EL RODEO, MORELOS	8	7	8	7	10	9	57
STA. FE DE LA LAGUNA, MICHOACAN	9	9	9	10	7	10	59
LA ESTANCIA, QUERETARO	7	9	10	6	9	8	56
TEXALUCA, PUEBLA	8	8	8	10	8	6	53

Key:

1. Area
2. Weight factor
3. Hydrology
4. Geology
5. Seismology
6. Soil use
7. Demography
8. Meteorology
9. Final evaluation

Subcritical reactor

Entrevista a Antonio Ponce *

El futuro de la energía en México

Heavy water pilot plant

Interior view of the Gamma Irradiation Plant. The control panel is on the left followed by the equipment room and the research hall.

5157
CSO: 5100/2258

URAMEX SEEKS URANIUM IN OAXACA

Mexico City EXCELSIOR in Spanish 14 May 81 pp 5-A, 8-A

[Article by Aurelio Ramos]

[Text] Oaxaca, 13 May--Ten crews of geologists are covering this area section by section with "a great potential" for locating new uranium deposits which would convert it into an excellent uranium-producing territory, according to statements made by the state office of Mexican Uranium (URAMEX).

Guillermo Albo Moreno, the representative of this public body, also stated that within two months, the exact volume of the reserves existing in the Lopez Portillo y Weber (LPW) deposit in the heart of Mixteca will be known.

This official expressed great hope that new deposits will be discovered through the silent, speedy and meritorious efforts of the geologists who are working in the mountains and valleys in search of this resource which represents the world's energy alternative. Oaxaca, he said, is seen to be one of the main areas in this field.

The greater part of the URAMEX work is being done in the settlement of Santa Catalina, Tayata, in the district of Tlaxiaco.

Other brigades of geologists are working in San Francisco, Cahuacoa, Pipi Yatatiu, Santiago Juxtlahuaca, Tlacotepec, San Pedro Coixtlahuaca, San Agustin Montelobos and Teozoatlan, among other settlements.

Albo Moreno noted that a few years ago, discouraged by the apparent lack of potential, the authorities of the then National Nuclear Energy Institute were about to eliminate the office representing this body in this state. Fortunately, while this decision was being discussed, geologists confirmed the existence of uranium in a fault 10 km long and 1 km wide in Santa Catalina Tayata.

This official stressed that not only is land prospecting being done, but there is also willingness to undertake studies with a view to the building of plants for the processing of this ore.

5157
CSO: 5100/2258

ARGUMENTS FAVOR PATZCUARO NUCLEAR CENTER

Mexico City EL SOL DE MEXICO in Spanish 12 May 81 p 2-A

[Article by Arturo de Aquino: "Patzcuaro, an Experimental Center for Nuclear Reactors"]

[Text] Lake Patzcuaro was selected as a site technically favorable for the installation of experimental centers for nuclear reactors.

As a result, discussions have been initiated there to persuade the people that there is no danger, particularly with regard to contamination.

The above was announced by engineer Antonio Ponce, director of the Nation Nuclear Industry Workers Union, who explained that the movement of environmentalists who oppose this decision on principle is gradually diminishing, and there is even now a group of people who are supporters of the building of the nuclear centers in the Michoacan zone.

Initially, he announced that nuclear researchers and technicians have been holding persuasive talks with the various residents living around the lake, in order to make them see that there is no danger and that in thinking there might be contamination problems, they are completely mistaken.

Also, he added that on Thursdays, Fridays and Saturdays, discussions for the same purpose will be organized at the University of Michoacan, higher schools and research centers, with the same National Nuclear Research Institute and National Nuclear Industry Workers Union personnel participating.

On the subject of the choice of Lake Patzcuaro as a suitable place for the building of the reactor centers, he said that technical studies were carried out in four states in the center of the country, where 17 sites favorable in various respects were identified.

When all of the data had been gathered and evaluated, he said, it was concluded that Patzcuaro is the place with the most positive aspects technically from the geological, seismological and meteorological points of view as well as other technical aspects.

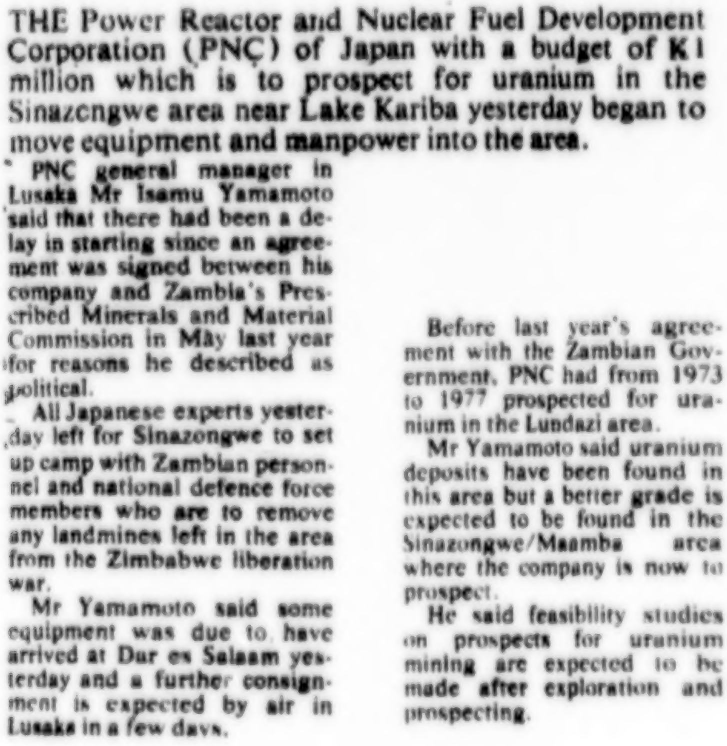
The practical decision was made in this fashion, he said, consistent with the technical indications established precisely in order to determine where the fewest possibilities of problems exist. Patzcuaro will be the first zone in which nuclear reactor centers will be built, making it possible to launch national nuclear-electrical development.

5157
CSO: 5100/2258

PNC MOVES EQUIPMENT FOR URANIUM PROSPECTING TO SIMAZONGWE

Lusaka TIMES OF ZAMBIA in English 17 Jun 81 p 2

[Text]



THE Power Reactor and Nuclear Fuel Development Corporation (PNC) of Japan with a budget of K1 million which is to prospect for uranium in the Sinazongwe area near Lake Kariba yesterday began to move equipment and manpower into the area.

PNC general manager in Lusaka Mr Isamu Yamamoto said that there had been a delay in starting since an agreement was signed between his company and Zambia's Prescribed Minerals and Material Commission in May last year for reasons he described as political.

All Japanese experts yesterday left for Sinazongwe to set up camp with Zambian personnel and national defence force members who are to remove any landmines left in the area from the Zimbabwe liberation war.

Mr Yamamoto said some equipment was due to have arrived at Dar es Salaam yesterday and a further consignment is expected by air in Lusaka in a few days.

Before last year's agreement with the Zambian Government, PNC had from 1973 to 1977 prospected for uranium in the Lundazi area.

Mr Yamamoto said uranium deposits have been found in this area but a better grade is expected to be found in the Sinazongwe/Maamba area where the company is now to prospect.

He said feasibility studies on prospects for uranium mining are expected to be made after exploration and prospecting.

CSO: 5100/4943

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July 7, 1981